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Magnetic Declination at Kew Observatory, 1890—1900.

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(From the National Physical Laboratory.)

(Abstract.)

The paper deals with the phenomena exhibited by the magnetic declination at Kew from 1890 to 1900. The magnetograph curves have been measured on every day of this period, whether disturbed or undisturbed, and the data from days of the different species are contrasted. Diurnal inequalities are got out for ordinary days, excluding those of large disturbance, and separately for the highly disturbed days, and the differences between these, and the points wherein they differ from the corresponding inequalities from *quiet* days, are investigated.

The disturbed days show a well-marked regular diurnal variation, which differs in many notable respects from that observed on ordinary days.

When the inequalities are analysed in Fourier series, it is found that the difference mainly centres in the 24-hour term, whose amplitude and phase seem both largely influenced by disturbance. The variation in the phenomena presented by disturbances throughout the year are investigated from several points of view.

The *absolute range* of the declination (absolute maximum less absolute minimum) was determined for every day of the 11 years, and special attention is given to the variation of this quantity throughout the year, and from year to year. With a view to throwing light on the theories of Arrhenius, Maunder and others, on the origin of magnetic storms, a minute comparison is made of the relationship between the absolute ranges and (Greenwich) sunspot areas throughout the 11 years. Whilst the results do not preclude the possibility that Arrhenius' theory may be true of a certain number of magnetic storms, they seem to indicate that it cannot be a complete explanation of the facts.

The paper aims at reaching results of a novel or critical character, and makes no attempt to chronicle the very bulky material, embracing over 100,000 actual curve readings, on which it is based.

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